

2014

MINISTER'S
ANNUAL REPORT ON
DRINKING WATER



Minister's Message

As Minister of the Environment and Climate Change, I am pleased to share with you the eighth annual Minister's report on Ontario's drinking water. This year's report highlights our approach to reducing the impacts climate change is having on our water supplies.

Climate change has been rightfully called the defining issue of our time. All over the globe, governments, industry and ordinary people are struggling with the challenges of a changing climate.

As our population grows along with our economy, so do the demands on our water resources. The value of our water cannot be underestimated or taken for granted. Access to clean water is essential to human health and for ecosystem integrity. It also supports a wide range of economic activities and sectors throughout the province, like food production, tourism and manufacturing.

Climate change can have a negative impact on our water resources. Soaring summer temperatures can result in warmer lakes and

ivers, especially in shallow water bodies, which can lead to potentially harmful algal blooms. More severe and frequent storms can wash more pollutants and excess nutrients off the landscape and into our water sources. This can lead to flooding and challenge the capacity of our infrastructure.

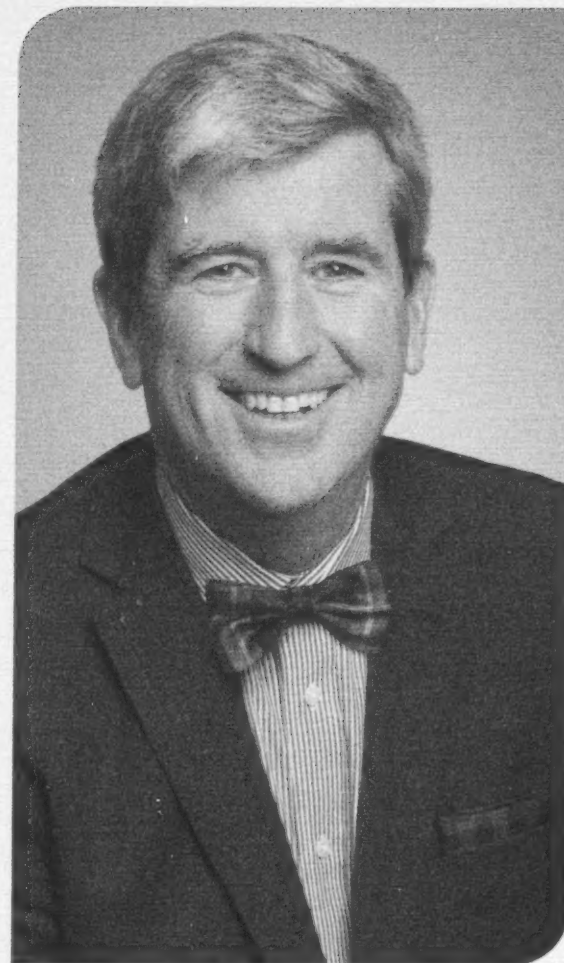
Ontario is committed to providing leadership in the fight against climate change, and we will work with our partners to develop strategies which best prepare us to meet these new threats.

I look forward to collaborating with our many partners and stakeholders who share our vision for a healthy environment. Together, we will rise to the challenge to ensure a safe and promising future for our children.

The Honourable Glen Murray

Minister of the Environment and Climate Change
Government of Ontario

December 2014



What is in this report?

A great deal of effort is focused on the Great Lakes, our largest supply of fresh water. Protecting the Lakes and ensuring they are resilient to the effects of climate change is a priority not only for the ministry but for many other organizations that depend on the Great Lakes for their water and their livelihoods. The first section of the report provides a summary of our actions to help ensure the Great Lakes are protected for generations to come.

Protecting water at its source, before it reaches your tap, is a critical shared

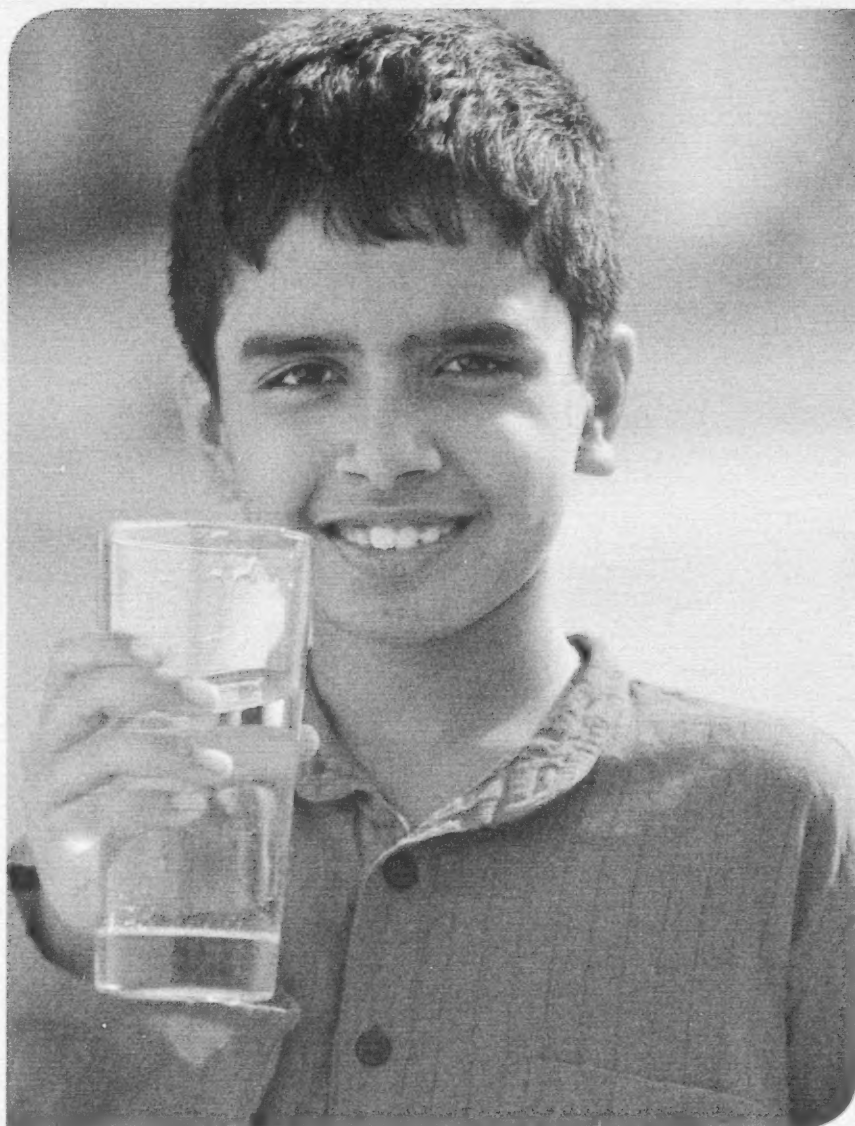
responsibility. Local multi-stakeholder committees are developing **watershed** plans to protect the sources of our drinking water. In this year's report, you will find an update on our progress on source protection and news about ongoing actions designed to protect our water supplies.

This year's report includes an update on the ministry's work to support drinking water for First Nations as well as a summary of the Chief Drinking Water Inspector's report highlighting the state of our drinking water here in Ontario. The report shows that 99.88

per cent of more than 530,000 test results from **municipal residential drinking water systems** met the provincial health-based drinking water standards.

The ministry will continue to develop and adapt our policies and programs, promote and support water conservation and innovative water technologies and expand on our work across ministries, with municipalities, **conservation authorities** and water agencies to help ensure your drinking water is safe and our water resources are protected.





Overview of Sections

This report covers a variety of information on actions to protect Ontario's drinking water and its sources.

Section 1

Discusses our provincial, national and international efforts to protect and restore the Great Lakes.

Section 2

Describes Ontario's source protection efforts and funding activities.

Section 3

Discusses emerging issues and the science used to address them.

Section 4

Provides an update on Ontario's efforts to support First Nations in producing safe, clean drinking water.

Section 5

Includes an overview of the ministry's compliance activities that help ensure safe drinking water for the people of Ontario.

SECTION 1

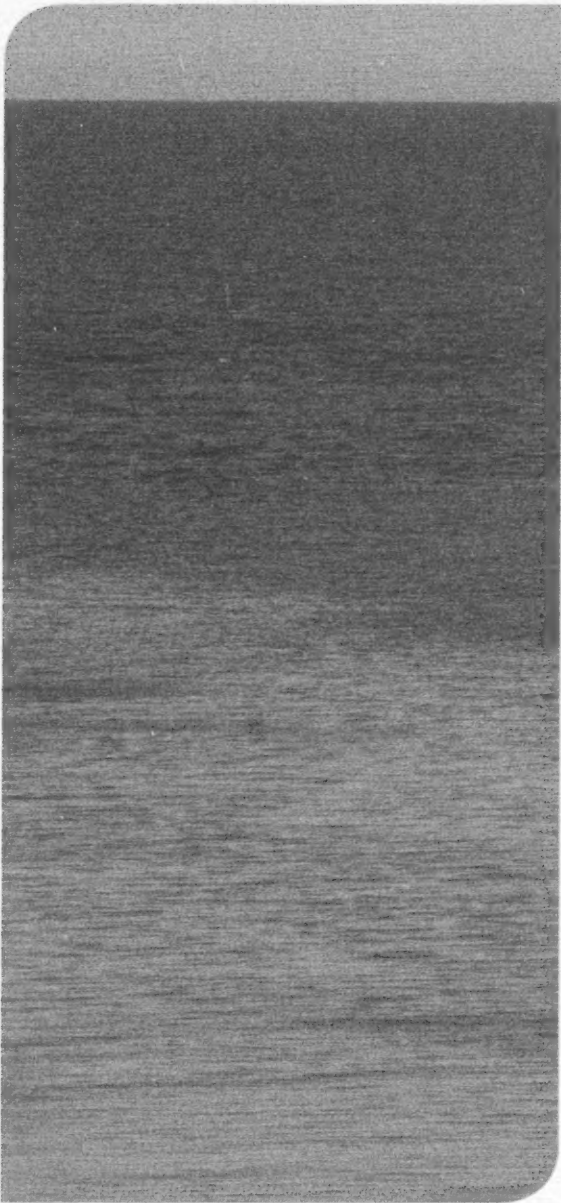


The Great Lakes

The Great Lakes are Ontario's prime source for fresh water. Most of our drinking water comes from the Great Lakes and over 95 per cent of our farming land is in the Great Lakes basin.

A growing population puts more demands on the Lakes and their water resources. Habitat loss from land development, loss of wetlands and the presence of invasive species and excess nutrients are all challenging the Lakes and their ability to be resilient to climate change.

Protecting and restoring the Great Lakes is a shared responsibility and the level of cooperation required to manage and protect this vast resource extends beyond our borders and involves municipal, provincial, national and international water partners. Local communities and grassroots organizations are also working to protect and restore their corner of the Great Lakes now and for future generations.



Ontario's Great Lakes Strategy

Ontario's Great Lakes Strategy, released in 2012, is our guide for actions to protect and restore the Great Lakes. Our vision is for a healthy Great Lakes and a stronger Ontario — Great Lakes that continue to be drinkable, swimmable and fishable. The Strategy is a result of a wide collaboration across Ontario ministries and with our Great Lakes partners, including First Nations and Métis communities, municipalities, **watershed** groups, the industrial, agricultural and tourism sectors, and other Great Lakes experts.

The Strategy aligns our efforts to protect and restore the health of the Great Lakes and St. Lawrence River basin and is organized around six goals:

1. engaging and empowering communities
2. protecting water for human and ecological health
3. improving wetlands, beaches and coastal areas
4. protecting habitats and species
5. enhancing our understanding and adaptation, including climate change
6. ensuring environmentally sustainable economic opportunities and innovation

Key projects and actions under the Strategy will improve water quality and reduce the occurrence of algal blooms and levels of unwanted nutrients from damaging the Lakes. For example, Ontario is committed to developing a nutrient target by 2016 to address algal blooms in the Great Lakes, and to bringing forward recommendations to meet that target.

The Great Lakes Guardian Community Fund

In addition to governments cooperating at every level to protect our shared source of drinking water, much work is also happening at the grassroots level.

With grants from the Great Lakes Guardian Community Fund, not-for-profit groups within communities on the Great Lakes are helping to protect habitat and species, clean up shorelines and restore wetlands to help manage the impacts of harmful runoff from stormwater.

The fund provides grants for projects contributing to at least one of the following goals:

- protecting water quality for human and ecological health
- improving wetlands, beaches and coastal areas
- protecting habitats and species

Not-for-profit community-based organizations, agricultural and landowner-focused organizations, environmental and conservation organizations, academic institutions, First Nations and Métis communities are among the eligible groups. **Conservation authorities**, municipalities and **local services boards** are eligible when they partner with at least one community-based organization.

Since 2012-13, \$3 million in funding has been awarded to 156 community-based projects. A third round of funding was launched on March 11, 2014.



EXAMPLES OF THE GREAT LAKES GUARDIAN COMMUNITY FUND PROJECTS

Thunder Bay: the North Shore Steelhead Association with partners, volunteers and collaborators from Lakehead University helped improve natural flows, riverside vegetation and habitat in George Creek to restore brook trout and its habitat in this historic trout nursery stream.

Lake Ontario watershed: the Halton Region Conservation Foundation, with Conservation Halton and community support from the Field

and Stream Rescue Team and Evergreen, worked toward removing invasive species, increasing the depth of Fourteen Mile Creek in North Oakville, creating wetlands and planting native grasses, wildflowers, shrubs and trees that will form a buffer to minimize the impacts of sediment and fertilizer runoff. This project helped rehabilitate more than five hectares alongside the creek.

Lake Huron's Georgian Bay: Environmental Defence Canada Inc., volunteers and Parry Sound community partners including the Georgian Bay Biosphere Reserve worked together to improve Waubuno Beach. They

removed invasive plants, organized a beach cleanup and introduced an educational shoreline tour to help the beach achieve international Blue Flag status and encourage community environmental stewardship.

Lake Ontario: the BurlingtonGreen Environmental Association, with its own Youth Network and community partners planted more than 250 trees and shrubs, removed 60 bags of invasive garlic mustard as well as other invasive species and cleaned up garbage from Beachway Park to improve the health of the beach and coastline on their part of Lake Ontario.

ONTARIO'S BLUE FLAG BEACHES

Blue Flag is an internationally recognized eco-label that is awarded to municipalities that meet stringent standards for water quality, environmental education, environmental management, and safety and services. The program promotes beach safety and enjoyment by recognizing beaches and marinas that adhere to all 32 Blue Flag standards.

Candidate beaches must fully comply with the Blue Flag global standards for water quality.

The Blue Flag is presented for one season and must be reapplied for annually, ensuring beaches and marinas are maintaining water quality and meeting all standards. There are currently 48 member countries and more than 4,000 Blue Flag beaches.

In 2014, 18 beaches and three marinas in Ontario qualified for Blue Flag certification and more municipalities are continuing to develop initiatives that comply with Blue Flag criteria.

For more information about this program and Blue Flag certified beaches and marinas in Ontario, visit environmentaldefence.ca/issues/blue-flag-canada.



Proposed Great Lakes Protection Act

To further advance Great Lakes protection, Ontario is committed to re-introducing a strengthened Great Lakes Protection Act that recognizes the importance of the Great Lakes to Ontario's environment, economy, and the health of our citizens. The proposed act would provide new tools to protect and restore the Great Lakes.

Entering into a New Canada-Ontario Agreement on the Great Lakes

As part of our government's commitment to protecting and restoring the Great Lakes, the Province and Canada have negotiated the eighth Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health. The new Agreement will continue our work to protect the Lakes from harmful pollutants, conserve fish and wildlife habitat, and restore Areas of Concern.

The Agreement consists of a Framework Agreement and 14 Annexes that contain specific goals, results and commitments.

The Agreement commits Ontario and our federal partners to taking action to benefit the Great Lakes, including:

- working toward making the Great Lakes more resilient to climate change through adaptation strategies and management actions
- strengthening collaboration with the Great Lakes community
- reducing excessive levels of nutrients and harmful pollutants
- protecting vulnerable coastal ecosystems
- improving our scientific understanding of problems in the Great Lakes
- continuing our work to conserve fish and wildlife habitat and keeping invasive species from entering the Lakes



The new Canada-Ontario Agreement includes commitments to help clean up contaminated hotspots, including the Bay of Quinte, Niagara River, Nipigon Bay, Peninsula Harbour and St. Lawrence River. Some examples of the work required includes long-term monitoring plans, plans to reduce excess nutrients from municipal wastewater and stormwater, completion of environmental status reports, and consultation with local Métis and First Nations communities to confirm environmental recovery.

The Great Lakes and St. Lawrence Cities Initiative

In addition to our work with our federal partners, Ontario is a partner of the Great Lakes and St. Lawrence Cities Initiative. Better known as the Cities Initiative, this group is a binational coalition representing 115 mayors from across the Great Lakes. Together, we work on many fronts to

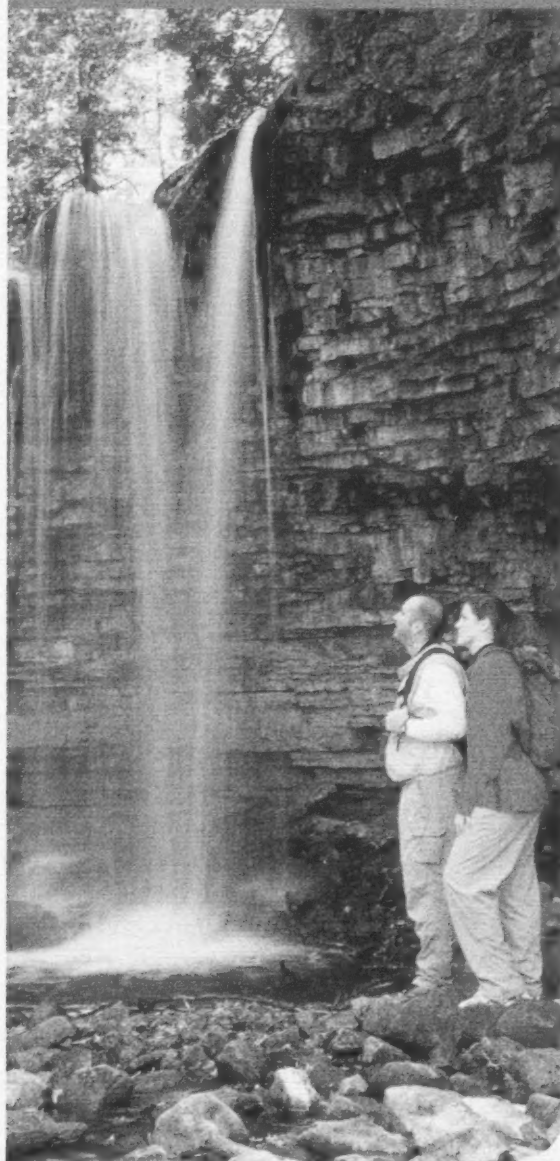
improve the ability of Great Lakes cities and towns to adapt to climate change.

One example is the Municipal Adaptation and Resiliency Service, to which the ministry has contributed \$145,000. The Cities Initiative launched the Service for its member municipalities to help them accelerate and expand their climate change

adaptation activities. Through a web portal, the Service provides information on adaptation, invites member cities to share their planned adaptation activities, and showcases demonstration projects that illustrate innovative approaches to climate adaptation and resiliency.



SECTION 2



Source Protection in Ontario

Protecting water at its source is a crucial first step in delivering safe drinking water. Ontario has the most comprehensive source protection program in Canada.

Our source protection program brought together 19 local-based source protection committees consisting of representatives from municipalities, farmers, First Nations, industry, and the general public who collaborated to produce **watershed**-based plans that are designed to protect the water quality and quantity of the lakes, rivers and sources of underground water that supply municipal drinking water systems.

The plans have explicit mandatory technical criteria and set out local actions to eliminate, manage or reduce potential risks to drinking water.

The source protection plans will protect the water supplies for more than 450 **municipal residential drinking water systems**. As of

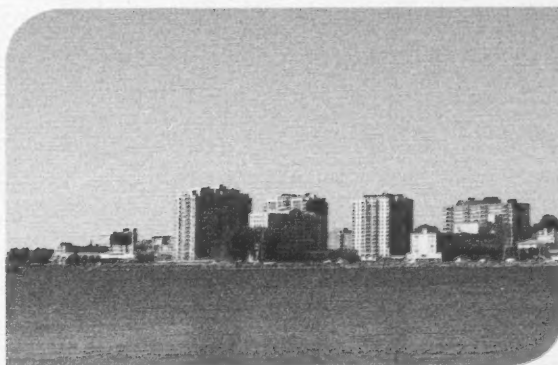
the beginning of December, half of these plans have been approved, and we are on track to review and approve the remaining plans by the end of 2015.

The Province has funded the entire source protection planning process to date. Over \$240 million has been provided to undertake scientific studies, build capacity within **conservation authorities** and municipalities and help landowners take early actions to protect water sources. In addition, the program provided \$24.5 million, which has funded over 3,000 local actions by landowners to protect water supplies.

Municipalities, conservation authorities, landowners and provincial ministries are responsible for implementing these locally-based source protection plans. To support their efforts, the ministry has trained more than 190 risk management officials and inspectors as of November 30, 2014.

APPROVED SOURCE PROTECTION PLANS AS AT THE BEGINNING OF DECEMBER 2014:

- Lakehead Source Protection Plan
- Niagara Peninsula Source Protection Plan
- Mattagami Source Protection Plan
- Mississippi-Rideau Source Protection Plan
- Quinte Region Source Protection Plan
- Sudbury Source Protection Plan
- Kettle Creek Source Protection Plan
- Catfish Creek Source Protection Plan
- Raisin-South Nation Source Protection Plan
- Trent Conservation Coalition Source Protection Plans
- Cataraqui Source Protection Plan



CLIMATE CHANGE READY

Under the Clean Water Act, climate change is being considered as we take action to protect sources of drinking water.

Source protection committees are using water budget models to determine whether a municipality will be able to meet

existing or planned future water demand for average and drought climate conditions.

Where there are potential water quantity issues, committees have identified measures that can be used to ensure sustainable drinking water sources.

Supporting Municipal Source Protection Efforts

We listened and responded to small, rural municipalities who needed assistance in preparing for implementation. Through the Source Protection Municipal Implementation Fund, the government is providing \$13.5 million of funding to help 188 small, rural municipalities offset some of the start-up costs as these municipalities prepare to implement their local source protection plans.

Some municipalities will be responsible for education and outreach in their local area to help protect our valuable drinking water resources. To assist these municipalities, the Ministry of the Environment and Climate Change developed an online catalogue which was released in partnership with Conservation Ontario. The catalogue

currently has information related to the management of agriculture, hazardous liquids, road salt and septic systems. Municipalities will be able to provide information to residents, associations and businesses on how to best manage their effect on local water sources.

The ministry is also supporting municipalities with a customized toolkit to help plan education and outreach locally. The toolkit will cover such areas as planning, partnership development and social media.

To view the catalogue and learn more about the tools and resources available for putting source protection plans into action, visit www.conservation-ontario.on.ca.

SECTION 3



Research and Emerging Issues

The Ministry of the Environment and Climate Change is committed to assessing risks to human health and the environment. Through a better understanding of climate change and new contaminants in the environment, we are better prepared to respond if we discover an issue that may impact our water resources.

Research and planning for needed changes to our programs and policies to accommodate climate change is ongoing. We are constantly looking for new technologies, innovative solutions and best science to ensure our efforts to protect and restore our water resources have the greatest chance of success.

Algal Blooms in the Great Lakes

Algal blooms in Lake Erie were a current topic this year. In August 2014, the Governor of Ohio declared a state of emergency when it was discovered that an algal bloom had compromised the water treatment facility in Toledo leaving nearly half a million people without access to clean water for two days.

Algal blooms can impact water colour, clarity, taste and smell. Several species of blue-green algae can create toxins and can have mild to severe effects on people, pets, fish and wildlife. Algal blooms can also cost municipalities and industry money when water intake pipes are clogged or when drinking water supplies need additional treatment to remove toxins.

Runoff from urban development and agricultural areas often contains nutrients such as phosphorus. These nutrients can contribute to increased algae growth. If overall global temperatures rise due to climate change, it is possible that local increases in water temperature may aggravate the problem.

The ministry has been monitoring for algal toxins at selected municipal drinking water treatments plants under the Drinking

Water Surveillance Program. In addition, all municipal drinking water systems that take water from the Great Lakes are now required to test the intake and treated water regularly during peak algae season.

To further reduce levels of phosphorus in Ontario's rivers, lakes and streams, we are working with the Ministry of Agriculture, Food and Rural Affairs, the Ministry of Natural Resources and Forestry,

conservation authorities, many U.S. partners and local stakeholders.

One of our key initiatives will see the ministry install monitoring instruments in 10 sub-watersheds in Southern Ontario to better understand changes in nutrient loadings, specifically from agricultural landscapes, and evaluate how agricultural land use influences the movement of nutrients into the Lakes.

USE OF OPTICAL PROBES TO ASSESS THE ONSET OF ALGAL BLOOMS

The ministry has sponsored a project through the Canada-Ontario Agreement on Great Lakes Water Quality and Ecosystem Health with the Essex Region Conservation Authority to evaluate the use of **optical probes** to assess the onset of algal blooms. This

technology may provide early warning if an algal bloom is forming and could be used by health authorities to alert the public and drinking water system operators if algal blooms are suspected.



ONTARIO'S 12-POINT PLAN ON BLUE-GREEN ALGAL BLOOMS

The ministry recently posted a 12-point plan that will help us fight the effects of blue-green algal blooms in the Great Lakes and other lakes and rivers. The following highlights the tools in the plan:

1. **Communication, engagement and partnerships**

We will continue to collaborate with other levels of government and communities on actions to reduce and address algal blooms.

2. **Reduction of nutrients**

Ontario is working to reduce the amount of nutrients that contribute to algal blooms entering water bodies.

3. **Protection**

Local source protection plans use different strategies to manage activities which may contribute nutrients and encourage algal blooms.

4. **Science and innovation**

Ontario is a leader in scientific and technical expertise and funds innovative research to address algal blooms.

5. **Support**

Ontario has financially supported initiatives to address water quality and ecological health in the Great Lakes basin.

6. **Legislation and regulatory tools**

Ontario has legislation and regulations as well as policies and programs in place to protect water quality.

7. **Water quality standards and guidelines**

Ontario has a Drinking Water Quality Standard for microcystin-LR — a common algal toxin.

8. **Monitoring**

Working closely with municipal drinking water systems, public health units, municipalities and other partners, we provide data to help inform decisions about taking action to protect public health.

9. **Public health**

Ontario has a comprehensive protocol in place which ensures collaboration with local health units and local medical officers of health to manage algal incidents.

10. **Contingency plans**

Contingency plans are developed by municipal drinking water systems to keep drinking water safe from the potential impacts of blue-green algal blooms.

11. **Analytical laboratory services**

If a harmful algal bloom is suspected, samples are submitted to laboratories licensed for analytical testing of algal toxins.

12. **Drinking water system courses**

The Walkerton Clean Water Centre delivers required refresher courses for drinking water system operators that include responding to and addressing potential algal concerns at drinking water plants.

For more information, visit www.ontario.ca. If you spot blue-green algal blooms, call the Spills Action Centre at 416-325-3000 or 1-800-268-6060 (TTY: 1-855-889-5775).

Microplastics in Lakes and Rivers

Small plastic pieces in ocean waters and accumulation of plastics in sea birds has been reported since the 1970s. These so-called microplastics are small pieces or tiny beads of plastic ranging in size from about 0.3 mm to 5 mm.

Microplastics come from the breakdown of plastic debris and litter washed into waterways from land or direct dumping. Microbeads from cosmetics and soaps and even fibres of certain synthetic fabrics can also enter our lakes and rivers through treated wastewater.

In 2014, ministry staff initiated a number of science and monitoring projects to determine the amount and types of microplastics present in and entering the Great Lakes near urban areas.

The projects include collecting and analysing samples from three typical municipal wastewater treatment plants discharging to Lake Ontario. Samples were also taken near urban areas on the Great Lakes and in streams in urban areas.

In addition, through the Great Lakes Strategy and the Canada-Ontario Agreement, the ministry provides funding to the University of Western Ontario to investigate **watershed** inputs of microplastics in sediments and

urban beaches in Lake Ontario and Lake Erie. This project aims to determine the final destination of microplastics once they enter the Great Lakes and the potential for exposure of sediment-dwelling organisms.

THE EXPERIMENTAL LAKES AREA

The Experimental Lakes Area is a world-renowned research facility located near Kenora, Ontario. For more than 40 years, the facility has provided ground-breaking science on the effects of pollutants on fresh water through the unique ability to carry out whole-lake research that reveals cause-and-effect relationships.

The facility includes 58 lakes on Crown land that are used to study responses in the ecosystem to determine physical, chemical and biological changes. The area attracts scientists from around the world who conduct research on pollution reduction and climate change that allows us to develop better strategies for protecting Ontario's water resources.

In May 2012, the federal government announced it would no longer fund this important research area. Since April 2013, the Ontario government has stepped up to provide the financial support necessary for continued research at the area with the International Institute for Sustainable Development as the new operator. Ontario also put new regulations in place to support experiments while ensuring the environment is appropriately protected.

Through support for the Experimental Lakes Area, Ontario is enabling research that will inform science-based decisions to protect our water resources, now and in the future.

For more information, visit www.iisd.org/ela.

Monitoring the Quality of Ontario's Water Resources

Water monitoring provides important information about the health of the Great Lakes, inland lakes, rivers, streams and groundwater.

Ministry staff regularly collect and analyse tens of thousands of water, sediment and aquatic life samples. This kind of monitoring helps us understand the impacts of human activity and climate change on our water resources and may also help to identify any emerging problems.



DRINKING WATER SURVEILLANCE PROGRAM

Developed by the ministry in 1986, the Drinking Water Surveillance program is a voluntary, science-based program that monitors source water and treated drinking water focusing on non-regulated drinking water quality parameters and emerging contaminants.

In cooperation with 108 municipal drinking water systems and three First Nations drinking water systems, the program routinely monitors for about 270 parameters such as pesticides, **disinfection by-products** and taste and odour compounds. Additional monitoring is also performed for algal toxins and **perfluorinated compounds**.

The program has been monitoring for algal toxins at selected drinking water systems since 2004. The results show that, when algal blooms occur near a water intake during summer and early fall, toxins can be detected in untreated source water but are almost never detected in treated drinking water samples, even at trace levels.

These findings suggest that Ontario's drinking water treatment facilities have been effective at removing or inactivating algal toxins of concern.

Water Conservation

Many of us are familiar with the benefits of conservation but do not always see the new and important need to increase water conservation in the face of a changing climate. Improving the rate of water conservation will gain even more importance as a changing climate puts our resources under pressure and affects the environment's natural ability to replenish itself.

When you have an essential water resource in vast supply, such as the Great Lakes, it is easy to overlook the long-term need for water management and water conservation. But wherever you live in Ontario, by simply using less water, you are helping to protect natural resources and reduce the strain on local water infrastructure and related facilities. Water conservation also lowers energy costs for families, businesses and municipalities.

Ontario's Showcasing Water Innovation program helps municipalities conserve water through the use of innovative technologies. The

Carrying a reusable water bottle wherever you go is both helpful to the environment and economical. Many businesses or public places in Ontario allow people to refill their containers for free. Find out more at www.bluew.org.

program funds a variety of projects focused on water conservation and efficiency, drinking water treatment and watermain rehabilitation.

Water conservation happens on the personal and the public scale every day as each of us makes choices about how we use water that affects our ability to adapt to climate change.

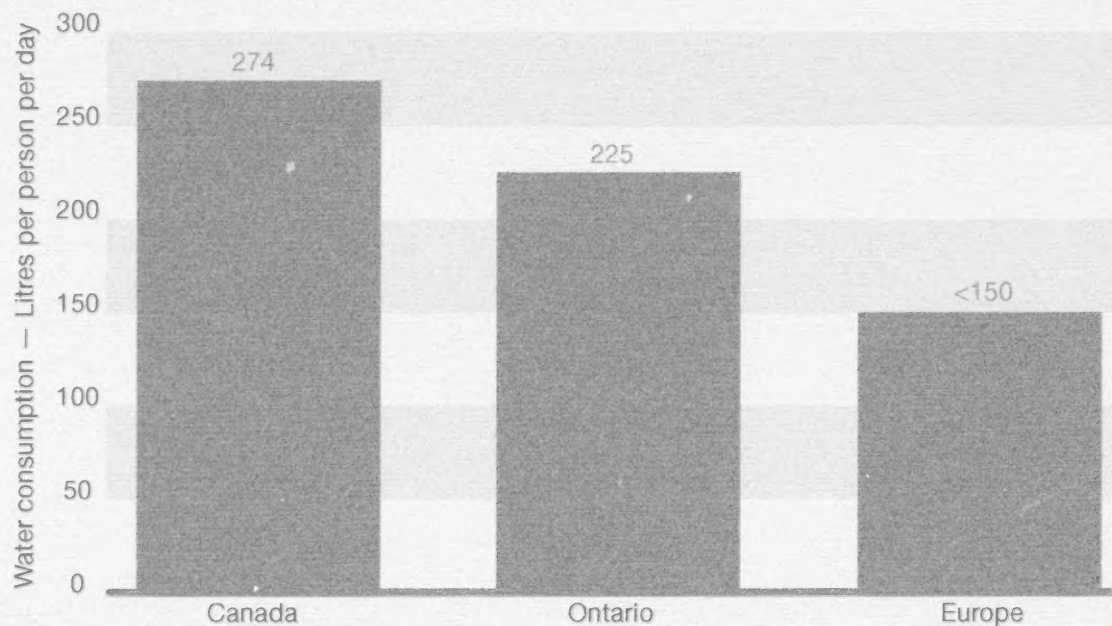
For example, Ontario's drinking water is of as good or better quality than your average bottled water product. By simply choosing tap water over bottled water or using refillable containers when possible, we can lower our carbon

footprint in several ways and help protect our water resources.

Designing Ontario's Water Infrastructure for Climate Change

In addition to promoting water conservation and our research on emerging contaminants, the ministry supports its partners in designing water infrastructure that is suitable for a changing climate. These efforts are in their early stages but infrastructure design and adaptation for existing water and wastewater treatment systems to deal with the effects

Figure 1: Water consumption around the world



of climate change will be a regular feature of government programs as we work to adapt and reduce these negative impacts.

The existing water infrastructure in Ontario was designed using historical weather patterns that show the intensity, duration and amount of rainfall in the province. With increasingly severe and intense storms, infrastructure may require designs that are based on projections of future weather patterns and climate.

With funding support from the Ministry of the Environment and Climate Change, Engineers Canada and its partners completed a climate change vulnerability assessment of the Union Water Supply System, which is jointly owned by the municipalities of Leamington, Kingsville, Essex and Lakeshore.

The recommendations from the study included the need to review procedures for operating in power outages including disruptions to communications.

The recommendations from the study can be used to incorporate climate change adaptation into current and future design, development, management, operations and maintenance of water infrastructure. For more information on this topic, visit www.unionwater.ca.



WELLAND — A LESSON IN CLIMATE CHANGE ADAPTATION AND STORMWATER MANAGEMENT

The Ministry of the Environment and Climate Change supported the City of Welland in investigating new and innovative ways of managing stormwater. In partnership with Niagara Region, Engineers Canada, Environment Canada and the Great Lakes and St. Lawrence Cities Initiative, Welland conducted a city-wide climate change risk assessment for municipal stormwater, sanitary and combined sewer infrastructure.

The study's objective was to identify components of the City's infrastructure assets that are at risk of failure, damage and/or deterioration from extreme weather events. Recommendations were categorized into actions including remedial engineering or operations, management and additional study or data.

Release of the report and associated outreach by the Great Lakes and St. Lawrence Cities Initiative supports municipalities in planning for infrastructure sustainability based on projected climate change impacts.

To learn more about the report, visit www.welland.ca.

SECTION 4



Drinking Water for First Nations

The ministry continues to support First Nations in several areas related to drinking water. For example, we support First Nations through the Drinking Water Surveillance Program, Ontario's Showcasing Water Innovation program, the Canada-Ontario First Nations Drinking Water Improvement Initiative and operator certification and training programs through the Walkerton Clean Water Centre.

Launched in July 2011, the Canada-Ontario First Nations Drinking Water Quality Improvement Initiative is a collaborative project that uses innovative approaches to help First Nations improve drinking water quality. The Province provides technical support while the federal government provides the funding for this collaborative work.

To date, construction on two projects has been completed and water treatment plants are now operating in Zhiibaahaasing First Nation on Manitoulin Island and Lac Seul First Nation near Sioux Lookout, resulting in the long-term boil water advisories being lifted.

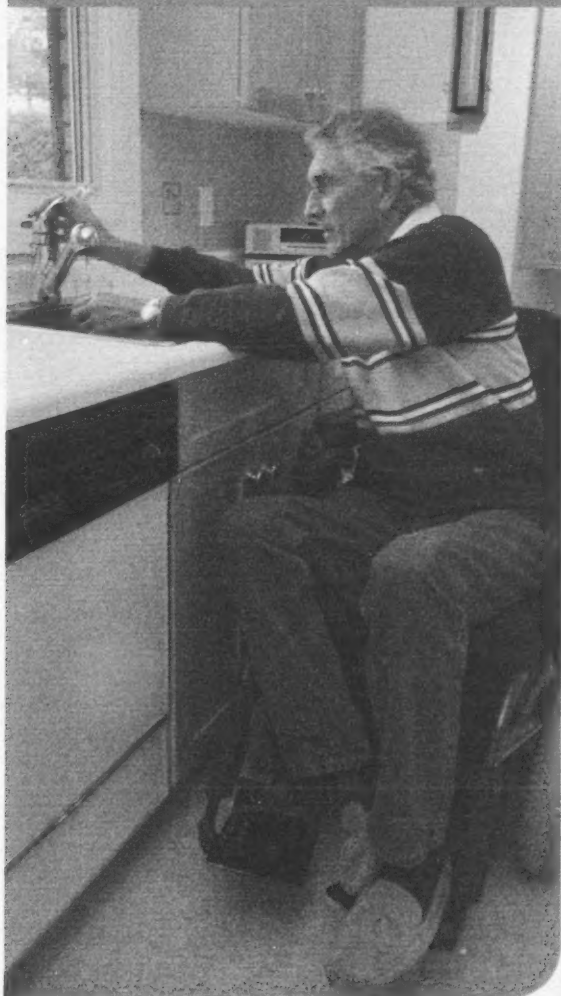
In Zhiibaahaasing First Nation, a new water plant using slow sand filtration and chlorine for primary disinfection is now operational.

The project also includes a new filling station, a water delivery truck, and several new and upgraded cisterns. The project covers the entire community, a population of approximately 50.

In Lac Seul First Nation, a new packaged water plant is now operational and a new stand-by well has been drilled. The system includes a three-stage cartridge filtration process and a two-stage primary disinfection system involving both UV treatment and chlorination. The project covers the Whitefish Bay community water system, which is one of three systems within Lac Seul First Nation, and serves a population of approximately 180.

The success of these projects demonstrates the potential of utilizing a collaborative approach with First Nations. The ministry will continue to work with the federal government and look at new ways of providing additional technical expertise to improve drinking water safety on First Nation reserves.

SECTION 5



Ontario's Drinking Water

Every year, our Chief Drinking Water Inspector delivers an annual report covering the performance of Ontario's drinking water systems, the laboratories that perform testing and analysis and also the number of enforcement orders and convictions issued by the ministry to system owners and/or operators who have failed to comply with Ontario's standards.

Ontario has a comprehensive drinking water safety net to protect your drinking water. The safety net is based on the idea that effective drinking water protection starts at the source and continues until you turn on your tap. The eight parts of the safety net are in place to help ensure that Ontario's drinking water is of high quality and continues to remain among the best protected in the world.



Figure 2: Ontario's drinking water safety net

Drinking Water Standards

Ontario has 158 health-based water quality standards for testing drinking water. These standards set limits for contaminants in drinking water. Most of these standards are based on Health Canada's Canadian Drinking Water Quality Guidelines which are reviewed regularly to ensure they reflect new information as it becomes available.

The Ontario Drinking Water Advisory Council also provides advice on drinking water quality and testing standards.

For more information on the work of the Advisory Council, visit www.odwac.gov.on.ca.



Performance Results for Ontario's Drinking Water

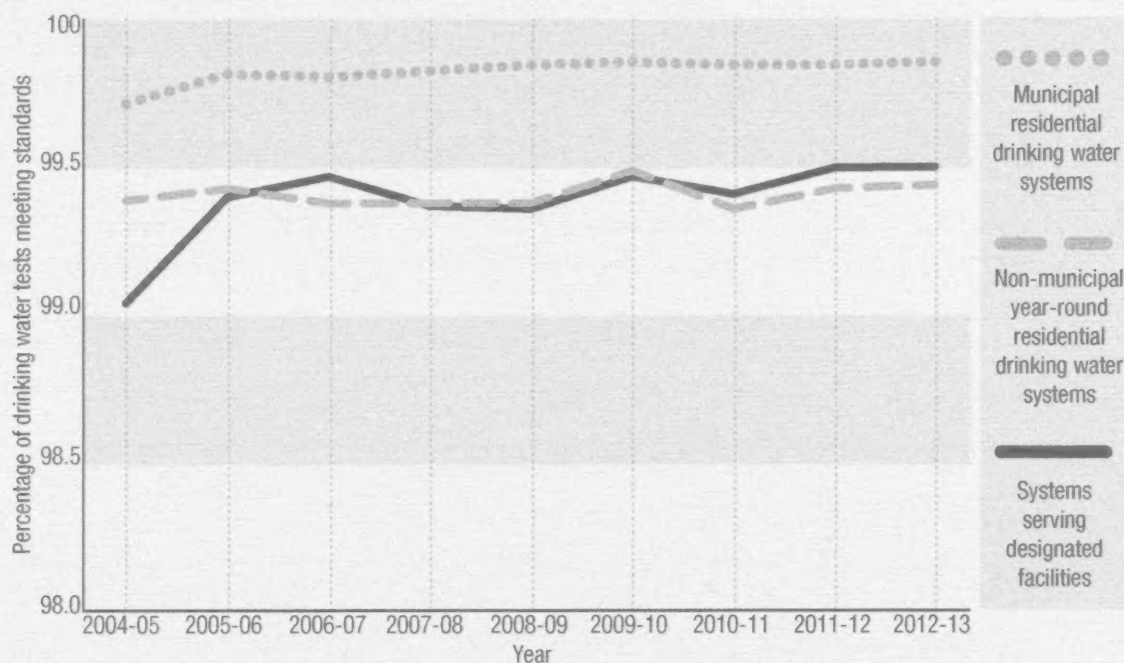
Ontario's drinking water systems are required to submit drinking water samples to laboratories that are licensed or eligible to perform drinking water tests. The tests determine whether the drinking water

sample meets provincial **drinking water quality standards**.

The performance results presented here cover the period from April 1, 2012 to March 31, 2013, as reported in the Chief Drinking Water Inspector's Annual Report 2012-2013.

Since 2004-05, more than 99 per cent of Ontario's drinking water quality performance results have been meeting the Province's health-based standards.

Figure 3: Trends in percentage of drinking water tests meeting standards



Key Findings of the Ministry's Inspection Program 2012-13

Municipal residential drinking water systems provide drinking water to more than 80 per cent of Ontario residents. Every year, ministry staff inspect all municipal residential drinking water systems and laboratories that perform drinking water analysis for Ontario's regulated drinking water systems to ensure they meet the Province's regulatory requirements.

In 2012-13, these systems demonstrated consistently excellent results and continue to meet Ontario's strict regulatory requirements:

- All 666 municipal residential drinking water systems were inspected:
 - 99.7 per cent of the systems inspected in Ontario achieved inspection ratings greater than 80 per cent.
 - 68 per cent of the systems inspected in Ontario achieved inspection ratings of 100 per cent.

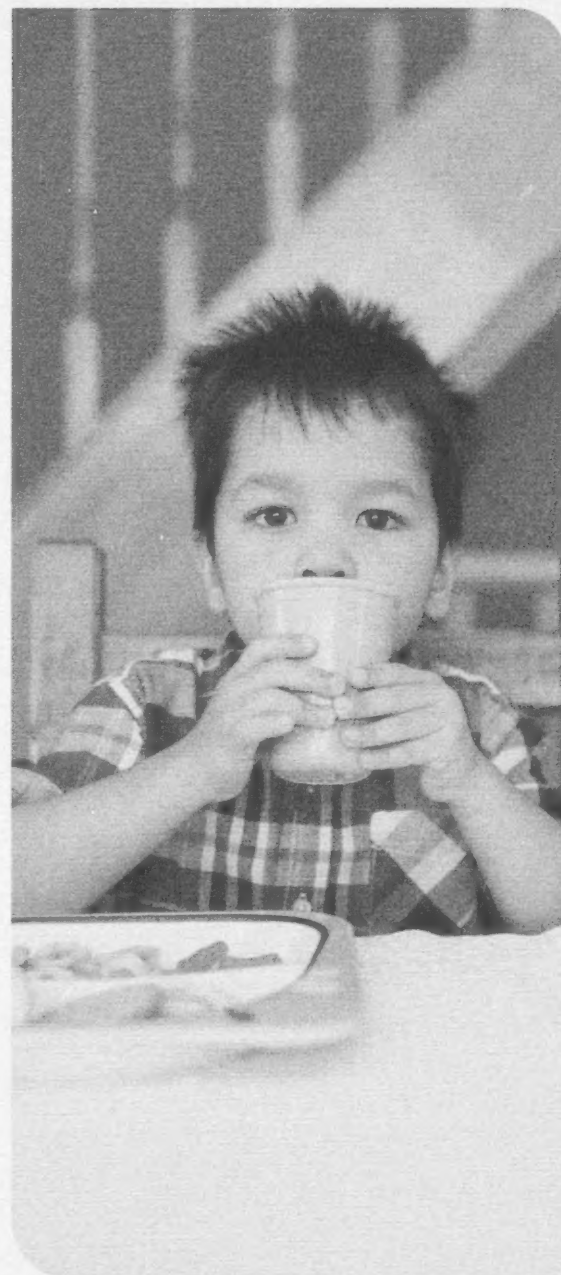
Our inspection results also demonstrate that the laboratories continue to meet Ontario's strict regulatory requirements.

Compliance and Enforcement Activities

When drinking water system owners and/or operators and licensed laboratory owners do not comply with Ontario laws, ministry staff may issue a **Provincial Officer's Order** or **Director's Order** or refer the matter to the ministry's Investigations and Enforcement Branch.

In 2012-13:

- A total of nine orders were issued to nine **municipal residential drinking water systems**.
- Twenty-one orders were issued to **non-municipal year-round residential drinking water systems** and **systems serving designated facilities**.
- Two orders were issued to one licensed laboratory and one non-licensed facility.
- One operator was barred from writing certification exams for one year.
- There were 14 cases involving convictions at 14 regulated drinking water systems and schools and day nurseries with fines totalling \$300,900.



Operator Certification and Training

Ontario's certified drinking water operators are among the best trained in the world. To meet our high professional standards, they must complete a rigorous program at the beginning of their careers. They must also complete 20 to 50 hours of training each year to keep their certifications.

In 2012-13, 719 new operators received 1,231 new operator-in-training certificates. Of these, eight operator-in-training certificates were issued to seven new First Nations operators.

As of March 31, 2013, 6,340 certified drinking water operators in Ontario, held 8,775 certificates. One hundred and thirty-five of these were employed as First Nations system operators across the province. These operators held a total of 205 drinking water operator certificates.

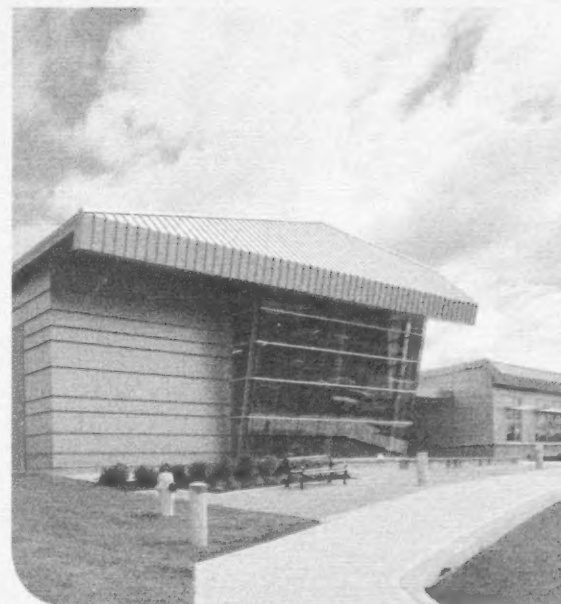
The Walkerton Clean Water Centre

The Walkerton Clean Water Centre provides high quality operator training programs on water treatment equipment, technology and operating requirements, and environmental issues, including water conservation. They

deliver province-wide training with a focus on small and remote drinking water systems including those serving First Nations.

The Centre offers hands-on and classroom training, as well as technology demonstrations in their state-of-the-art facility. The Centre also serves as a platform for research on cost effective solutions for small drinking water systems.

As of September 30, 2014, the Walkerton Clean Water Centre has trained 51,384 new and existing professionals. For more information, *visit* www.wcwc.ca.



Final Thoughts

Climate change is a global issue that requires immediate action. Its effects on our water sources are real and pose many challenges for Ontario. We will strive to meet these challenges with a dedicated staff of professionals working with our many partners and stakeholders to make real, positive change for the sake of our children and the future of our beautiful planet.

As we increase our overall efforts to cope with a changing climate, protecting our drinking water will remain a top priority for the ministry.

As we increase our efforts over the coming years to protect the Great Lakes, keep our water supply clean and advance the implementation of source protection plans, we will be that much closer to ensuring all people in Ontario can rely on a safe, reliable source of fresh water not just for today, but for generations to come.

Our dedicated staff and our many water partners are working to help ensure that when you turn on your tap in Ontario, you can be confident in the fact that your drinking water is among the best protected in the world.



Resources and More Information

The Great Lakes

Ontario's Great Lakes Strategy: www.ontario.ca/environment-and-energy/ontarios-great-lakes-strategy

Great Lakes Guardian Community Fund: www.ontario.ca/environment-and-energy/great-lakes-guardian-community-fund

Examples of the Great Lakes Guardian Community Fund Organizations:

- North Shore Steelhead Association: www.northshoresteelhead.com
- Lakehead University: www.lakeheadu.ca
- Halton Region Conservation Foundation: www.conservationhalton.ca/foundation
- Conservation Halton: www.conservationhalton.ca
- Field and Stream Rescue Team: www.streamrescue.com
- Evergreen: www.evergreen.ca
- Environmental Defence Canada Inc.: environmentaldefence.ca
- Georgian Bay Biosphere Reserve: www.gbbr.ca
- BurlingtonGreen Environmental Association: www.burlingtongreen.org

The Great Lakes and St. Lawrence Cities Initiative: www.glslcities.org

Source Protection in Ontario

Source Protection: www.ontario.ca/environment-and-energy/drinking-water

Conservation Ontario: www.conservation-ontario.on.ca

Resource catalogue: www.conservation-ontario.on.ca/library?view=category&id=66

Research and Emerging Issues

Algal blooms:

- Ontario's 12-point plan on blue-green algal blooms: www.ontario.ca/environment-and-energy/blue-green-algae
- Grand River Conservation Authority: www.grandriver.ca
- Optical probes — Essex Region Conservation Authority: erca.org

Microplastics in Lakes and Rivers:

- University of Western Ontario: www.uwo.ca

The Experimental Lakes Area: www.iisd.org/ela

Water Conservation:

- Showcasing Water Innovation: www.ontario.ca/environment-and-energy/showcasing-water-innovation
- Blue W: www.bluew.org

Designing Ontario's Water Infrastructure for Climate Change:

- Engineers Canada: www.engineerscanada.ca
- Union Water Supply System: www.unionwater.ca
- Welland — A Lesson in Climate Change Adaptation and Stormwater Management: www.welland.ca/Eng/pdfs/TP111002WellandVol001Final.pdf
- Region of Niagara: www.niagararegion.ca
- Environment Canada: www.ec.gc.ca/?lang=En

Ontario's Drinking Water

Health Canada's Canadian Drinking Water Quality Guidelines:

www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php

Ontario Drinking Water Advisory Council: www.odwac.gov.on.ca

Drinking Water Surveillance Program: www.ontario.ca/environment-and-energy/drinking-water-surveillance-program-dwsp-data

Chief Drinking Water Inspector's Annual Report 2012-2013:

www.ontario.ca/environment-and-energy/chief-drinking-water-inspector-annual-report-2012-2013

The Walkerton Clean Water Centre: www.wcwc.ca/en

Glossary

Conservation Authorities: local watershed management agencies that deliver services and programs that protect and manage water and other natural resources in partnership with government, landowners and other organizations (www.conservation-ontario.on.ca).

Director's Order: a legal instrument issued by an appointed Ministry of the Environment and Climate Change Director under the authority of a provision of a statute administered by the Minister of the Environment and Climate Change.

Disinfection By-products: are a group of compounds that can form when the chlorine used to disinfect drinking water reacts with naturally occurring organic matter (e.g., decaying leaves and vegetation).

Escherichia coli (E. coli): a species of bacteria naturally present in the intestines of humans and animals. If animal or human waste containing *E. coli* contaminates drinking water it may cause gastrointestinal disease in humans. Most types of *E. coli* are harmless, but some active strains produce harmful toxins and can cause severe illness.

Local Services Boards: provide services (including, in some cases, water services) to communities in areas of Northern Ontario without municipal structure. They are established pursuant to the Northern Services Boards Act. Drinking water systems run by Local Services Boards are generally categorized as non-municipal year-round residential drinking water systems under O. Reg. 170/03 under the Safe Drinking Water Act.

Municipal Residential Drinking Water System: drinking water systems or part of a drinking water system that serve six or more private residences that meet the definition of municipal drinking water system under the Safe Drinking Water Act and its regulations.

Non-municipal Year-round Residential Drinking Water System: drinking water systems that serve a major residential development (more than five private residences) or a trailer park or campground with more than five service connections.

Ontario Drinking Water Quality Standards: regulated standards (O. Reg. 169/03, Ontario Drinking Water Quality Standards made under the Safe Drinking Water Act) for microbiological, chemical and radiological parameters that, when present above certain concentrations in drinking water, have known or suspected adverse health effects and require corrective action.

Optical Probes: are designed to measure the pigments present in cyanobacteria. If there is an increase in cyanobacterial population, there will be an increase in pigments that will be detected by the optical probes.

Perfluorinated Compounds: are a family of chemicals used to make products resistant to heat, oil, stains and grease.

Provincial Officer's Order: an order issued by a Ministry of the Environment and Climate Change Provincial Officer to any person that contravenes any act governed by the ministry requiring action to correct the contravention.

Systems Serving Designated Facilities: drinking water systems that only serve designated facilities such as schools (elementary and public), universities, colleges, children and youth care facilities (including day nurseries), health care facilities, children's camps and delivery agent care facilities (including certain hostels).

Watershed: area of land where all the water that is under it or drains off of it goes into the same watercourse or body of water.



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For more information:
www.ontario.ca/drinkingwater

